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Standardized Note Template Improves Screening of Firearm Access and Driving Among Veterans With Dementia

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Little is known about screening used in clinical practice to assess driving and firearm safety among patients with dementia. A case-controlled study was performed, including 22 patients with dementia seen in a geriatric evaluation and management clinic and 22 matched patients with dementia seen in a memory assessment clinic. Data about prevalence of firearm use and driving were obtained. In geriatric evaluation and management clinic, 57.9% of patients had dementia, compared with 71.0% in memory assessment clinic, and more patients were diagnosed with Alzheimer dementia in memory assessment clinic ($P = .005$). In geriatric evaluation and management clinic, 65% of patients had driving screening compared with 100% in memory assessment clinic ($P = .07$). Four percent in geriatric evaluation and management clinic were screened for firearm access versus 100% in memory assessment clinic ($P < .001$). In memory assessment clinic, 31.8% had firearms access and 50% were driving. Many patients continued to drive and have access to firearms. The use of templates for the progress note was effective in increasing the screening rate.

Keywords: firearms; driving; dementia; screening; computerized medical records

Dementia is a common illness, and its prevalence is expected to increase. Currently, 3 to 4 million North Americans over the age of 60 years have dementia, and this number is anticipated to triple by the year 2040.[1] It is estimated that approximately 5% to 10% of the U.S. population over the age of 65 years has Alzheimer disease, the most common type of dementia. Age is the major risk factor for dementia. The population is continuing to age with an expected boom of older adults in the near future. Thus, doctors will continue to see increasing numbers of older patients and more patients with dementia.

When caring for patients with dementia, assessing and ensuring both personal and public safety are of critical importance. Patients with dementia are likely to exhibit impaired visual-spatial performance, poor judgment and insight, and unrealistic assessments of their abilities,[2] as well as increased levels of aggressive behaviors, impulsivity, delusions, and psychosis.[3] These deficits tend to increase as the dementia progresses. Given the large number of potential impairments, several organizations advocate for assessment of firearm and automobile use among patients with dementia.[2-5] Although the precise rates of compliance with these recommendations are not known, one study suggests that the rate is low.[6] Among a group of vulnerable older people receiving care from 2 managed care organizations, several quality indicators were assessed including safety counseling for patients with dementia.[6] The authors found that only 35% of the caregivers for patients with dementia were being counseled about

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safety. Thus, although screening for firearm access and driving safety is recommended, the data suggest few providers are performing this task.

To determine the degree to which driving and firearm safety was being evaluated in patients with dementia, a quality improvement project was undertaken at the William S. Middleton Memorial Veterans (VA) Hospital, Geriatric Research, Education and Clinical Center (GRECC), in Madison, Wisconsin. The hypothesis was that the frequency of screening for firearm access and driving safety in patients with dementia would be greater than the previously published rate of 35% and that the memory assessment clinic (MAC) would be better than the geriatric evaluation and management (GEM) clinic in performing this screening because of the more focused interest of MAC.[6]

Methods

Data were collected retrospectively in a case-control format. Computerized charts were reviewed for all patients seen in the GEM intake clinic for just over a 6-month period (September 1, 2005 to March 6, 2006). The number of patients with dementia evaluated in the GEM clinic was then matched with consecutive new patient assessments performed in the MAC at the same institution over the same period of time to total an equal number of patients with dementia. The charts of subjects with dementia were compared for safety evaluation. For 1 patient seen in both clinics, only the first visit was counted. Data collected included age, number of prescribed oral medications, sex, and presence of dementia. If the patient met the National Institute of Neurological and Communicative Disorders and Stroke-Alzheimer's Disease and Related Disorder Association (NINDS-ADRDA) criteria for possible or probable Alzheimer disease[7] by history and Mini-Mental State Examination (MMSE),[8] the patient was then considered to have dementia. A single reviewer (NKL) reviewed all charts. The number of prescribed medications was chosen as a surrogate measure of comorbid illness.

The GEM clinic is the initial visit for all patients who are being followed by the primary care geriatrics service or for consultation at the William S. Middleton Memorial Veterans Hospital, Madison, Virginia. The patient is seen by a nurse practitioner or physician (typically an internal medicine [IM] resident or geriatrics fellow, as well as a faculty geriatrician) for a comprehensive geriatric assessment. This GEM assessment routinely includes review of current medications, medical history, psychosocial assessment, cognition (MMSE,[8] clock draw test,[9] and animal fluency test[10]), mood,[11] visual acuity,[12] orthostatic blood pressures, nutrition, activities of daily living screen, and mobility and balance. There is a computerized GEM progress note template for this physician visit, which does not include a prompt to ask about driving or firearms. The patient is asked to bring a caregiver, family member, or significant other to the GEM visit as well. This second person is interviewed by a social worker (staff or social work intern) to obtain collateral information. If the patient did not bring a family member or friend, then the patient himself is interviewed by the social worker. The interview of the social worker is also guided by an independent templated electronic medical record note to structure the discussion. This GEM social work template contains a prompted question for driving, but not for firearms. The patient's case is then discussed in the GEM multidisciplinary meeting including the examining physician and geriatrician, a geriatric psychiatrist, social worker, nurse practitioner, and trainees to formulate a plan prior to the patient leaving the clinic.

The MAC is staffed by a geriatrician, a geropsychiatrist, a neuropsychologist, and a social worker. The patients are typically seen first by an IM resident or geriatrics or geropsychiatry fellow. Again, patients are asked to bring a family member or significant other along, and a MAC social worker conducts a similar interview to the one performed at the GEM intake clinic, also guided by a templated note. Of note, the MAC social work template includes a prompt to ask about safety issues, including driving, firearms, and power tools. All new patients, in addition to a medical history and physical, have a battery of neuropsychological tests administered by a neuropsychology technician or neuropsychologist. A MAC multidisciplinary meeting is undertaken with all involved providers prior to the patient leaving the clinic.

Driving evaluations are performed in the VA occupational therapy department. In this evaluation, the occupational therapist uses a Dynavision machine and Porto Clinic/Glare unit in addition to other tests of the patient's reaction times and visual-spatial abilities and judgment. The occupational therapist may recommend adjustments to driving patterns, such as a limitation in nighttime driving,

Table 1. Demographic Information of Evaluated Patients

	GEM Clinic (n = 22, Except as Noted)	MAC (n = 22, Except as Noted)	*P* Value for Group Differences
Age, mean (SD), y	80.6 (6.1)	77.9 (7.0)	.15
Male, n (%)	22 (100)	21 (95)	.32
Patients with dementia, n (% of total number of charts evaluated)	22 (57.9)	22 (71.0)	.96
Of patients with dementia, number diagnosed with Alzheimer disease, n (% of patients with dementia)	19 (30.0)	20 (72.0)	<.01
MMSE score (mean), among patients with dementia, mean (SD)	22.9 (5.8)	17.0 (5.4)	.09
No. of medications among patients with dementia, mean (SD)	11.5 (5.9)	8.0 (5.4)	.04

Abbreviations: GEM, geriatric evaluation and management; MAC, memory assessment clinic; SD, standard deviation; MMSE, mini-mental state examination.

local only driving, or driving with a navigator. The recommendation from the occupational therapist may also be that the patient be tested by the state department of transportation.

The primary endpoint was to determine the rates of screening for firearm access and driving among patients with dementia. Using SPSS software, version 14.0 (SPSS Inc, Chicago, Illinois), a nonparametric comparison Kruskal-Wallis test was conducted to compare the number of medications and age of subjects. Chi-square comparisons were performed for the rates of screening for driving and firearms between the 2 clinics.

Results

Demographic information is presented in Table 1. There was a higher-than-expected burden of dementia in the GEM clinic compared with the prevalence seen in other VA populations, aged 65 years and above (Table 1).[13] Not surprisingly, there was also a high level of dementia among the patients with MAC (Table 1). Also, the mean number of prescribed oral medications was quite high in both clinics suggesting a high level of comorbidity. However, the mean number of medications was higher in the GEM clinic (Table 1). Most of the patients were male.

In the GEM clinic, 65% of the patients with dementia were asked about driving but only 4% (n = 1) were asked about firearms (Figure 1). The inquiry about driving was exclusively done by the social worker and about gun safety was done by a physician. In contrast, all patients seen in the MAC were asked about driving, as well as firearms, and this query was nearly exclusively done by the social worker. The difference in rates of screening for firearm use between the 2 clinics was statistically significant, though the difference in the rate of assessment for driving safety among patients with dementia in the 2 clinics was not (Figure 1).

Further analysis of firearm access and driving safety in the MAC was conducted because this clinic successfully screened all patients for these safety concerns. In the MAC, nearly one-third of patients had access to firearms (Table 2), most of which were unlocked and with easy access to ammunition. Among the patients in the MAC, counseling was provided to 4 of 7 (57.1%) patients, and no intervention was documented for the remaining 3 (42.9%) patients (Table 2). Half of the patients with dementia continued to drive at the time of their initial evaluation. In many cases, more than 1 action was taken to address safety. In all, 7 patients (63.6%) were referred to occupational therapy for a driving evaluation, and 6 patients (54.5%) were counseled about driving safety. In 2 patients (18.2%), no action was documented (Table 2). In any patient, neither documentation that a letter was sent immediately to the department of transportation was found nor this was recommended by an occupational therapist.

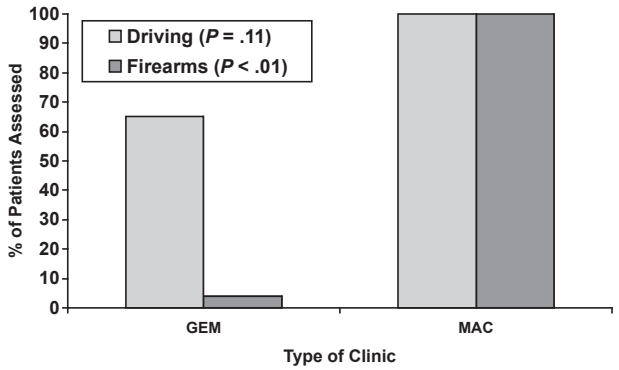

Figure 1. Prevalence of assessment of driving and access to firearms among geriatric clinics. GEM indicates geriatric evaluation and management; MAC, memory assessment clinic.

Table 2. Prevalence of Access to Firearms and Driving Among Patients With Dementia and Action Taken by Clinician (Memory Assessment Clinic)

	N (%)
Patients with dementia with access to firearms	7 (31.8)
Counseling	4 (57.1)
No action documented	3 (42.9)
Patients with dementia still driving	11 (50.0)
Referral for occupational therapy driving evaluation	7 (63.6)
Counseling	6 (54.5)
Letter to department of transportation	0 (0)
No action documented	2 (18.2)

Discussion

In this study, we found that rates of screening for access to firearms and driving safety were higher than previously reported, especially in clinics that used a prompted interview from an electronic template. As the population continues to age, dementia will become even more common. Crucial to the care of the patient with dementia, as well as to the public well-being, is a regular assessment of safety, which includes asking about firearm access and driving safety. We were moderately successful in our GEM clinic at assessing patients with dementia about driving. This success is directly related to the use of a standardized interview by the social worker. However, despite the GEM staff's specialty training in geriatrics, which should increase sensitivity to safety issues unique to aging and cognitive decline, the rate of screening for firearm use in the GEM clinic was still low. This is likely related to the lack of a prompt to inquire into gun safety in the template for the electronic progress note. In the MAC, we were highly successful at asking about driving and firearm access among patients with dementia. Thus, a progress note template was successful in increasing rates of screening for safety concerns among VA patients with dementia.

It is notable that very few physicians in the GEM clinic or MAC asked about either driving or guns independently. The GEM clinic and MAC function using an interdisciplinary team, and as such, collateral information gathered from all team members is shared. Nevertheless, without the aid of the clinic social worker, the level of safety screening in patients with dementia seen in the GEM clinic and MAC would be much below the previously published levels. This is an important fact to emphasize for general medicine and family practice providers, who typically do not have other providers available to assist in obtaining additional information about their patients with dementia. It is important for physicians to review these data and highlight safety evaluations in their progress notes.

One-third of the patients with dementia seen in the MAC still had access to firearms, despite their memory impairment. Southern and western Wisconsin, as well as northern Illinois, is the catchment area for the Madison, Virginia. This prevalence of firearm access is similar to previously reported figures for gun ownership across the entire U.S. population.[14] It suggests that families of patients with dementia and patients themselves are not removing firearms from their homes without intervention.[15] Veterans may also be more likely to continue to possess firearms than the general population despite dementia, given their military training with firearms and the known association with posttraumatic stress disorder (PTSD) and firearm possession.[16,17]

Most patients with memory impairment continue to have access to firearms. For example, Spangenberg et al[15] reported that over 60% of homes of patients with dementia continued to have firearms, with an average of 2.6 guns per household. The severity of the dementia, prior behavioral disturbances or a history of depression did not predict for the presence or absence of firearms. Similarly, the

level of education and race were also not predictive. Only 16.9% of families with guns reported that these weapons were kept in an unloaded state. The families involved in this study were aware of the patient's diagnosis of dementia for a mean of 2.7 years, more than ample time to address firearms in the home. These results bring into question the prior assumption that family members are motivated to remove guns from the homes of their loved ones with dementia.[18]

The recommended action to take when a provider identifies that a patient with dementia has access to firearms is to counsel the patient and family for removal of the firearms.[15] Other alternatives would include counseling the family to unload the guns, place a trigger lock on the gun, or store the weapons in a locked cabinet and away from ammunition.[18] Delusions that may make one prone to using a firearm (eg, delusions of theft) should also be aggressively treated.[19] In addition, any patient who is thought to be a danger to themselves or others should be reported to the authorities.[19]

Half of the patients with dementia in this study continued to drive. There is much variability in the published rates of continued driving among patients with diagnosed dementia, ranging from 12%[20] to nearly 47%.[21] Strikingly, the data from this study fall at the high end of that published range. This may represent a selection bias, given that many of our patients live in a rural environment and require an automobile as a means of day-to-day living, as public transportation is not routinely available to them.[22,23] However, given the large number of patients with dementia, if up to half are continuing to drive, this represents a potential public health risk.

Many patients with dementia also continue to drive despite their diagnosis.[21] Drivers with dementia have more accidents,[24-26] and the severity of cognitive impairment does not predict likelihood of an accident.[27] Despite recommendations to the contrary,[28] most patients with dementia who drive do so alone.[27] In addition, clinicians are only mildly successful at predicting which patients with dementia should not be driving.[29] The gold standard for assessing driving skills continues to be a department of motor vehicles, department of transportation, or professional driving instructor assessment.

When a patient with dementia continues to drive, the treating physician should counsel the patient about driving safety.[1] A formal driving evaluation should be considered for any patient with a MMSE of 24 or less.[30] For mild dementia, driving with a navigator, limiting night time driving, and driving only short distances may enhance safety.[28] For patients with more severe deficits who continue to drive despite counseling to the contrary, notification to the state department of motor vehicles or department of transportation may be required. Several states also require mandatory reporting for any patient with a diagnosis of dementia, and physicians should be familiar with laws in their state.

Finally, this study determined that an effective means of ensuring screening for safety issues among patients with dementia is to use a standardized note to aid the initial interview. A standardized note can be effective in any physician's office. As a result of this research, the physician and social work templates for the GEM clinic have been amended so all providers ask about firearms, as well as driving. Clinicians have been asked to consider an increase in the level of intervention, such as counseling and driving evaluation, for these critical safety issues. Further, as this research reveals, there is a role for other allied health professionals, not just for physicians and nurse practitioners, to perform safety evaluations. This work also emphasizes the value of the team approach, used so frequently in geriatrics.

There are several limitations to this study. This study represents a small sample size, and our population only accurately reflects safety assessment and concerns for male veterans. Certainly, some safety issues will differ for women. In addition, many of our veterans may suffer from PTSD, thus falsely elevating the rate of possession of firearms.[17] In this study, patients were not assessed for prevalence of concurrent PTSD. In addition, this sample represents a largely Caucasian, rural, midwestern population, so ability to generalize these results may be limited. As this study only considered medical records, it is likely that more screening and counseling was done than was reflected in the progress notes. Thus, it is important for providers to document what counseling and screening takes place during a visit.

Unanswered questions include what is the most effective way to address safety concerns and how to improve compliance with recommendations by the family and the patient. In addition, we did not determine the rates of firearm access and driving by severity of dementia. Furthermore, safety concerns for patients with dementia, such as the use of ladders and tools, particularly power tools, remain to be studied.

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